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## Digitized Engineering Notebook

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## ABSTRACT

Digitized engineering notebook is the digital form of an engineering notebook. The idea behind this is to help users by creating a web application to create, share, document engineering ideas, practices and journals. This digital notebook allows users to store text data, images and graphs. This digital notebook presents the content same as that of the notebook but in a more efficient way for users to store their project information. Through this application user can access their project status and keep updated with it. Digital notebook allows users to create files online while working with their team in real-time. All the data is stored in the database so it can be easily queried and reported.

Advantage of this digital notebook is to safeguard all the projects done by the users. Through this the users can take a reference of the previous projects and easily share the project document globally. Digitized engineering notebook has three user groups: an administrator group, team leader and a member group, designed according to their roles. Administrator login has responsibilities for site maintenance, create, update, delete and manage accounts. User login takes us through the Digitized Engineering Notebook, where the team leader can create a new project, access the existing project, maintain the records and work logs, etc. The best part is that, the user can back up his project data as a .pdf document, which is very helpful for the user in document submission and presentations. This project is built on an open-source platform.

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## **1 Project Description**

The objective of this project is to build a Website application of a Digitized Engineering Notebook, which simulates the actual characteristics of paper notebook for recording laboratory works. This helps the user to record works in a digital version of notebook, which is more convenient to edit, modify, share and reuse. This Digitized Engineering Notebook helps its users to create Teams, Projects, edit them and download it into a pdf format which can be easily shared and submitted. It allows its users to store records of text, data and images. It helps team members to collaborate with each other in real time and build their high standard of Engineering Notebook.

### **Modules:**

**Captain:** When building up a professional project, a team leader plays a key role in managing the team and the project. Here, in this project the team leader is regarded as a “Captain”. A Captain is prioritized user in the project who creates teams, projects; accept member requests, delete members; add, edit and delete project log entries. A Captain is responsible for the overall management of team and project.

**Member:** Every individual working for a project is equally important, here, we call such individual as “Member”. A member helps in building up the project. In this project, member must decide which team he wants to join while he signs up. Once a Member gets approved by the Captain, they can access the project; they view and add the content to the project. Though they cannot edit an existing entry, they can add a new entry, view all entries and download them.

**Administrator:** Administrator is the super user of the system. Admin can do anything to the website like setting up home page; changing the websites look; manage Captain and Member accounts; manage Teams; manage Projects and giving permissions to other users.

### **1.1 Competitive Information**

In the current market, there are not a lot of web applications providing such features, as it is an emerging idea. Out of the few competitors, this Digitized Engineering Notebook stands alone with its unique features. It gives roles in the projects for captains and members setting up their priorities respectively. This kind of priority is unique and not usually seen with the competitors. Its design and architecture are user friendly, which are easy to understand and implement. The best part of the application is, user can download the entire project or a part of it as a pdf document. Such features make the project outstanding in the market.

### **1.2 Relationship to Other Applications/Projects**

This project is not directly related to any other projects. This is rather developed as an educational project as a part of course work at Governors State University.

### **1.3 Assumptions and Dependencies**

We can assume that this Digitized Engineering Notebook will increase the ability of the students to interact and create a Digitized project. It helps users to create multiple teams and projects; which helps them to manage more than one project at a single place. This project helps students to record their lab work together, which is simultaneously accessible to all the team members. Editing the project is also very easy as it is Digitized. Features like adding and editing text data, images and hyperlinks sets up a new milestone in the educational field. This will improve overall educational benefits of the students and increase the standards of education.

### **1.4 Future Enhancements**

This Digitized Engineering Notebook is designed for educational institutions. In the future, more features can be added like, to set up scheduled assignments, provide space to share the educational documents and many more. A real-time chat room can be enabled so that the students can discuss what, why and how are they recording the laboratory progress.

### **1.5 Definitions and Acronyms**

PHP	Hypertext Preprocessor
SQL	Structure Query Language
MVC	Model View Controller

## 2 Project Technical Description

Development Environment:

- Operating Systems: Windows 7/8/10
- Web Server: Apache
- PHP: Codeigniter Framework
- Languages: Java Script, HTML and CSS.
- Database: MySQL
- Client Browser: Chrome/Mozilla Firefox.

### 2.1 Application Architecture

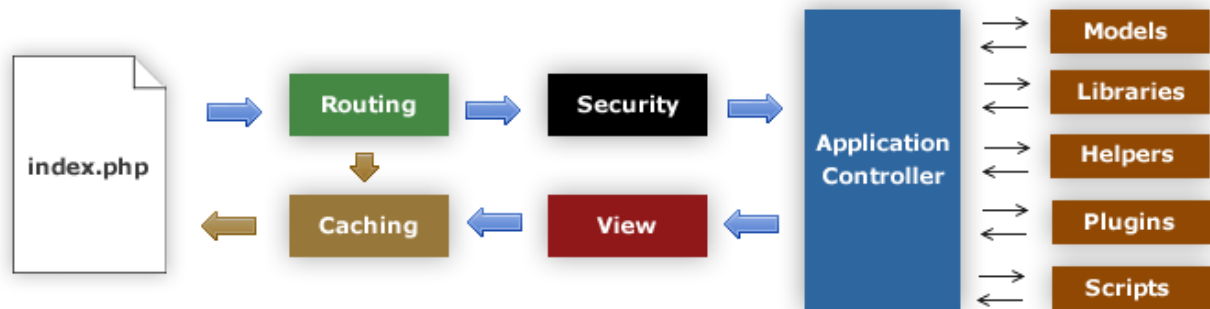


Figure 1: Architecture of the application

### 2.2 Application Information flows

This section provides the details about the end-to-end functionality of the entire Digitized Engineering Notebook. This project is developed for improving the educational benefits of the students. This project helps students to enroll themselves with their roles as captain or member. These roles give them their priorities to deal with in the project. Apart from them, the administrator plays a key role in the project. Admin controls and manages the entire application. All their functionalities are described here below:

Home Page: The Home page of Digitized Engineering Notebook welcomes the users with a welcome note.



Figure 2: Home Page

About Us: This page says about the Digitized Engineering Note Book that how it is helpful for the user in many ways.

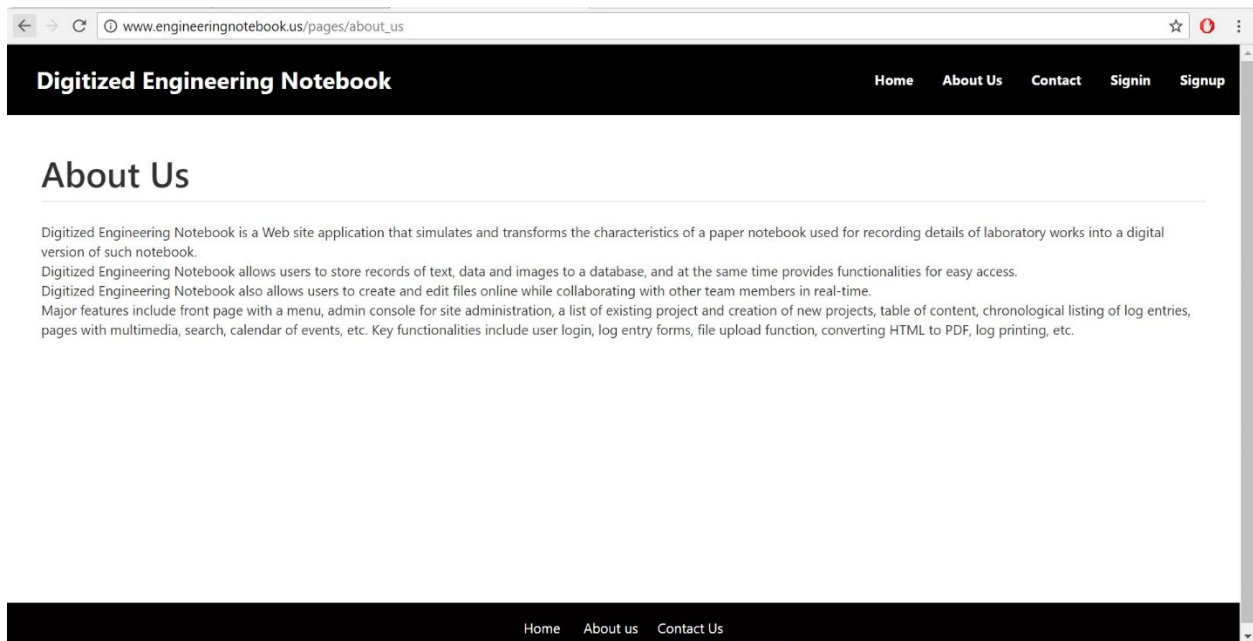


Figure 3: About Us Page

Contact Us: This page displays the Digitized Engineering Notebook's location of office and its e-mail address and phone number.

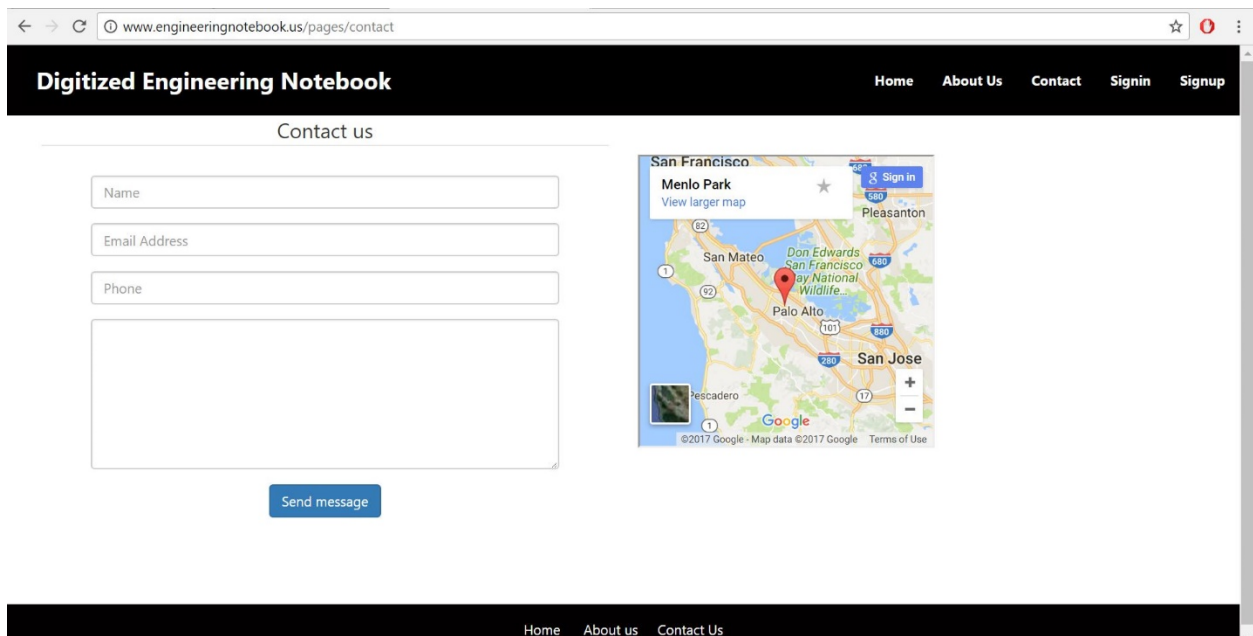
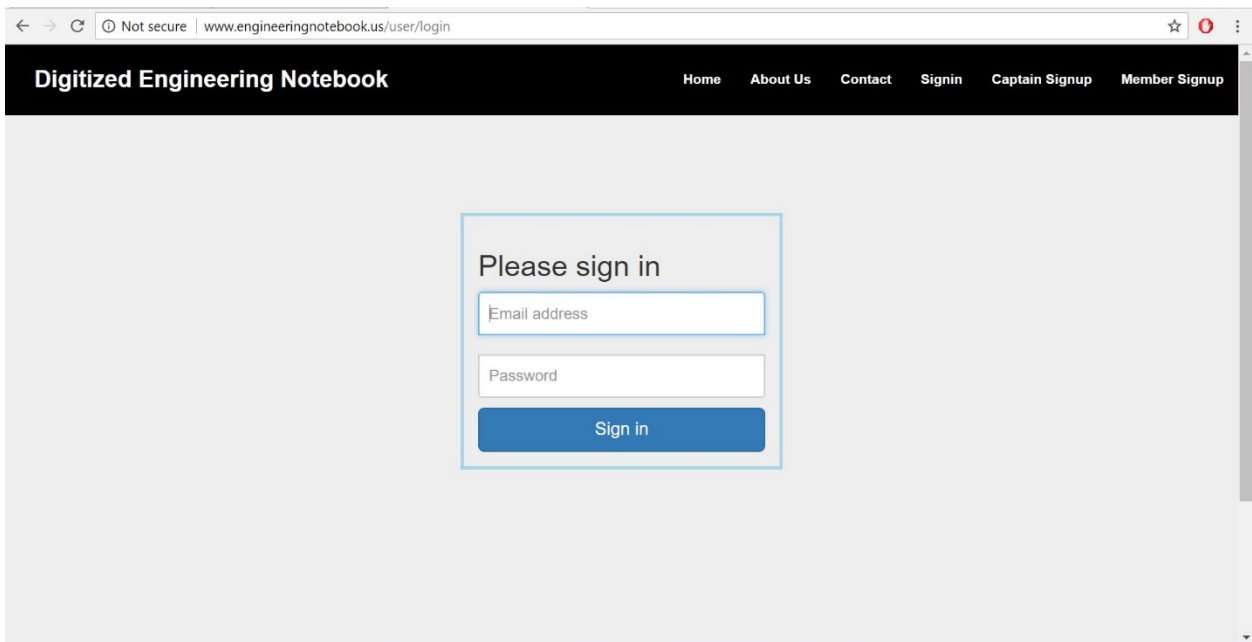


Figure 4: Contact Us

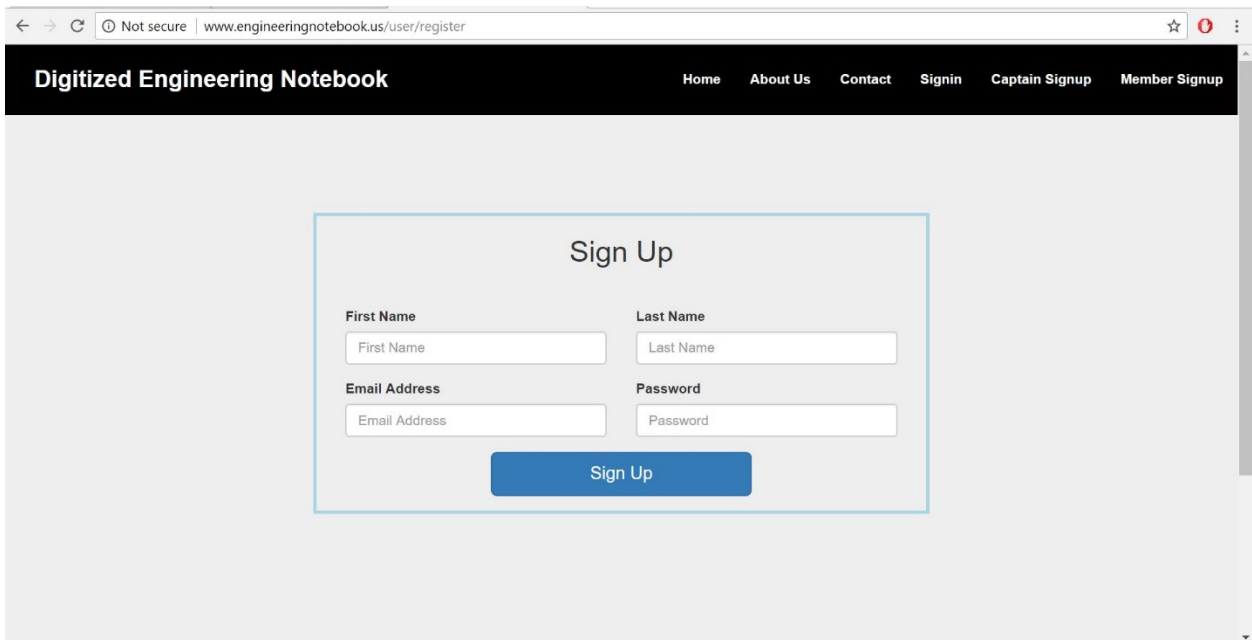
This is the login page of Digitized Engineering Notebook.



The screenshot shows a web browser window with the address bar displaying "Not secure | www.engineeringnotebook.us/user/login". The page has a black header with the site name "Digitized Engineering Notebook" on the left and navigation links "Home", "About Us", "Contact", "Signin", "Captain Signup", and "Member Signup" on the right. The main content area is light gray and contains a white box with a blue border. Inside this box, the text "Please sign in" is at the top. Below it are two input fields: "Email address" and "Password". At the bottom of the box is a blue button labeled "Sign in".

Figure 5: Login Page

This is Sign Up page for a Captain, so that the user can request as a captain to the admin.



The screenshot shows a web browser window with the address bar displaying "Not secure | www.engineeringnotebook.us/user/register". The page has a black header with the site name "Digitized Engineering Notebook" on the left and navigation links "Home", "About Us", "Contact", "Signin", "Captain Signup", and "Member Signup" on the right. The main content area is light gray and contains a white box with a blue border. Inside this box, the text "Sign Up" is at the top. Below it are four input fields arranged in two rows: "First Name" and "Last Name" in the first row, and "Email Address" and "Password" in the second row. At the bottom of the box is a blue button labeled "Sign Up".

Figure 6: Captain Sign Up Page

This is Sign Up page for the Member, in this the Member need to select a team and send's request to the captain to join a team.

The screenshot shows a web browser at the URL [www.engineeringnotebook.us/user/member\\_user](http://www.engineeringnotebook.us/user/member_user). The page has a black header with the site name "Digitized Engineering Notebook" and navigation links: Home, About Us, Contact, Signin, Captain Signup, and Member Signup. The main content area is light gray and contains a "Sign Up" form. The form has the following fields: "First Name" (text input), "Last Name" (text input), "Email Address" (text input), "Password" (text input), and a "Team" dropdown menu with "Select Team" as the current selection. A blue "Sign Up" button is positioned below the form fields.

Figure 7: Member Sign Up Page

The figure shown is a Captain's Dashboard, Captain has a unique function that he can create and delete a Team and Project.

The screenshot shows a web browser at the URL [www.engineeringnotebook.us/user/dashboard](http://www.engineeringnotebook.us/user/dashboard). The page has a black header with the site name "Digitized Engineering Notebook" and navigation links: Home, Teams (with a dropdown arrow), Projects (with a dropdown arrow), and "Hello Rineesh" (with a dropdown arrow). The main content area is light blue and contains a "Dashboard" title. Below the title are three white circular buttons: "+ Create Team", "Teams list", and "+ Create Project". At the bottom of the page is a black footer with links: Home, About us, and Contact Us.

Figure 8: Captain Dashboard



This Figure shows the Members Dashboard; Member can only view Team list and Projects list.

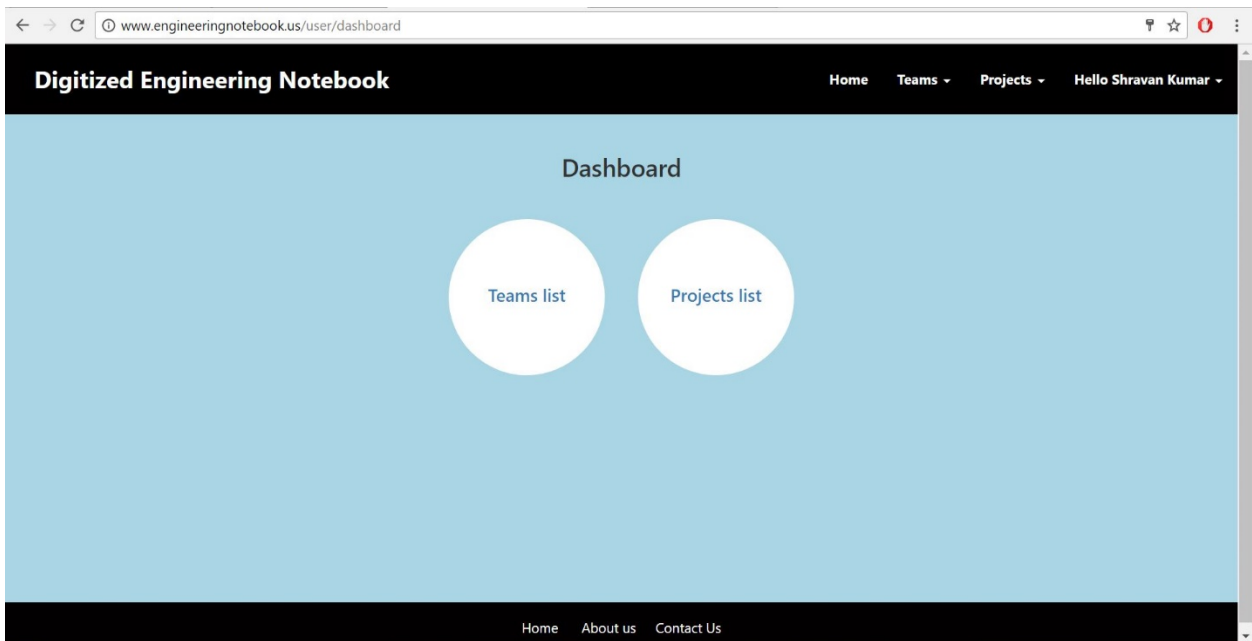


Figure 9: Team Member Dashboard

This is the page to create a team for the project by captain. team id, team name, team status, created date should be given by the captain.

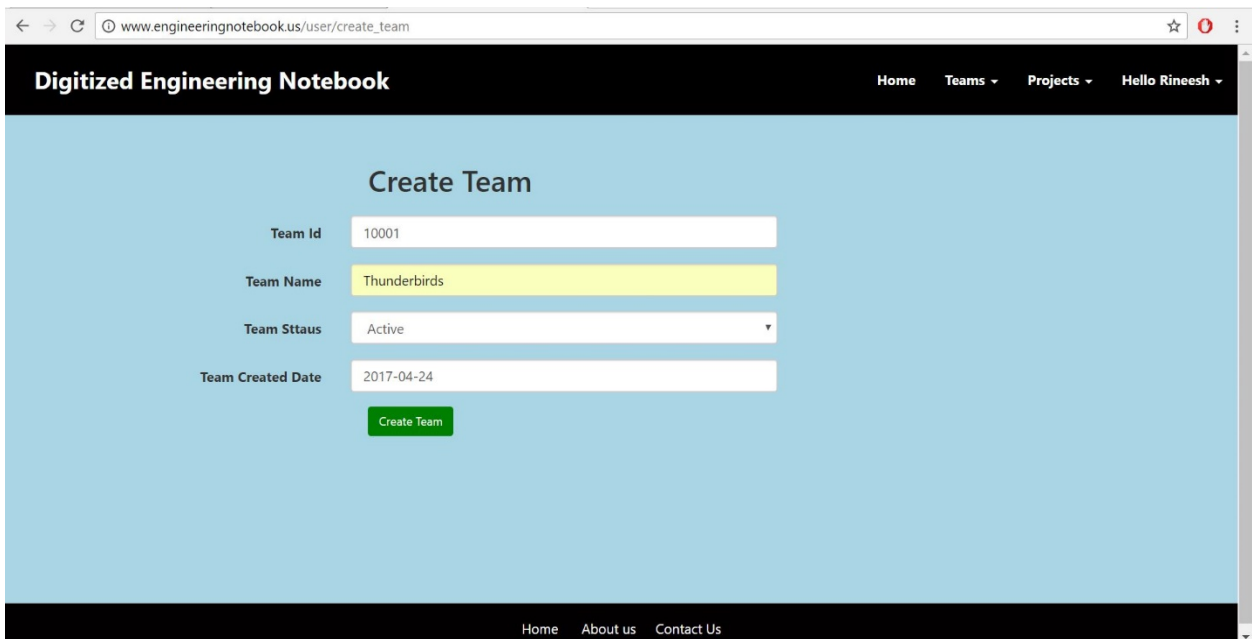


Figure 10: Create Team Page

This is the page to create a project by captain. Project name, project Description should be given by the captain.

The screenshot shows a web browser at the URL [www.engineeringnotebook.us/user/create\\_project](http://www.engineeringnotebook.us/user/create_project). The page has a dark blue header with the text "Digitized Engineering Notebook" and navigation links: "Home", "Teams", "Projects", and "Hello Rineesh". The main content area is light blue and titled "Create project". It contains two input fields: "Project Name" and "Project Description". Below these fields is a green button labeled "Create project". At the bottom of the page, there is a dark blue footer with links: "Home", "About us", and "Contact Us".

Figure 11: Create Project Page

In this field, logs can be entered describing the part of activity done in the project with its output and summary.

The screenshot shows a web browser at the URL [www.engineeringnotebook.us/user/add\\_log\\_entry/5](http://www.engineeringnotebook.us/user/add_log_entry/5). The page has a light blue header with the text "Add Log Entry". The main content area is divided into several sections. On the left, there are input fields for "Entry Date" (2017-04-17), "Title" (My Pet Project), and "Duration" (10:00am to 5:00pm). Below these is a "Tasks" section with a rich text editor. On the right, there are sections for "Attendance" (Bo, Kristen, Marcos, Matt, Chris, Aidan, PJ, Coach, Progra) and "Reflections" (a rich text editor). At the bottom right, there is a list of three tasks: 1. Examine Cougar Robotics shifting gear box, 2. Look through Patronum Bots engineering notebook, and 3. Learn something new.

Figure 12: Add Log Entry Page

This field allows to edit the log entries. The authority to edit the log entries is restricted to captain only.

**Edit Log Entry**

Entry Date: 2017-04-24

Title: Cougar Robotics Build-A-Better-Bot

Duration: 9:00 am - 5:00 pm

Attendance: Bo, Kristen, Marcos, Matt, Chris, Aidan, PJ, Coach, Progra

Reflections:

1. Cougars brought their World championship robot from Block Party, Matt and Coach got a chance to see how the drive shifter was constructed. (See details.)
2. Patronum had their award winning engineering notebook out for examination and we each paged through it. (See details.)
3. We came back with new ideas, especially about

Tasks:

1. Examine Cougar Robotics shifting gear box
2. Look through Patronum Bots engineering notebook
3. Learn something new

Figure 13: Edit Log Entry Page

After entering the logs, this is the captains page where the edit option is available as the editing authority is given only to the captain.

**Digitized Engineering Notebook**

Home Teams Projects Hello Rineesh

Project: Got Robot?

About: This is a Robotics project.

Date: 2017-04-24

Download Pdf

From date To date Search

**04.24.2017 Cougar Robotics Build-A-Better-Bot** Duration 9:00 am - 5:00 pm Edit

**Attendance:**

Bo, Kristen, Marcos, Matt, Chris, Aidan, PJ, Coach, Programming Coach Stephen, Mentor Solomon

**Tasks:**

1. Examine Cougar Robotics shifting gear box
2. Look through Patronum Bots engineering notebook
3. Learn something new

**Reflections:**

1. Cougars brought their World championship robot from Block Party, Matt and Coach got a chance to see how the drive shifter was constructed. (See details.)
2. Patronum had their award winning engineering notebook out for examination and we each paged through it. (See details.)
3. We came back with new ideas, especially about preventing disconnections. (See details.)

Figure 14: Captain View Logs Page

This screenshot is the output of the member view logs page, where the edit option is not available as member does not have access for editing.

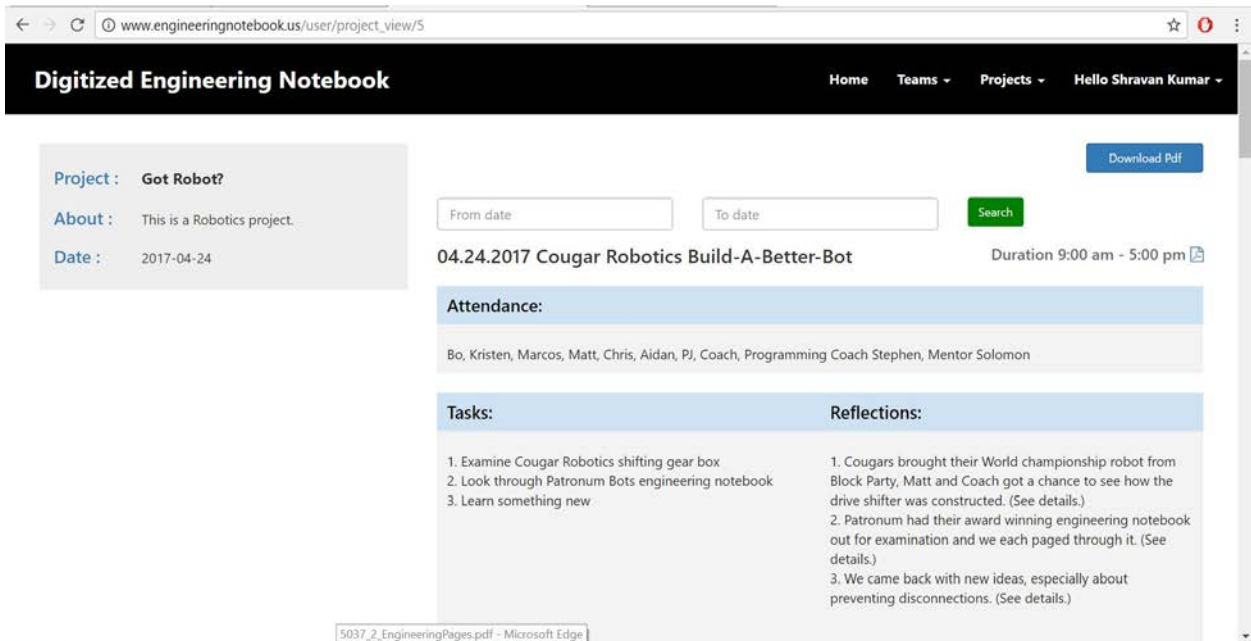


Figure 15: Member View Logs Page

This is the captain project list page, this shows all the projects in which the captain is involved.

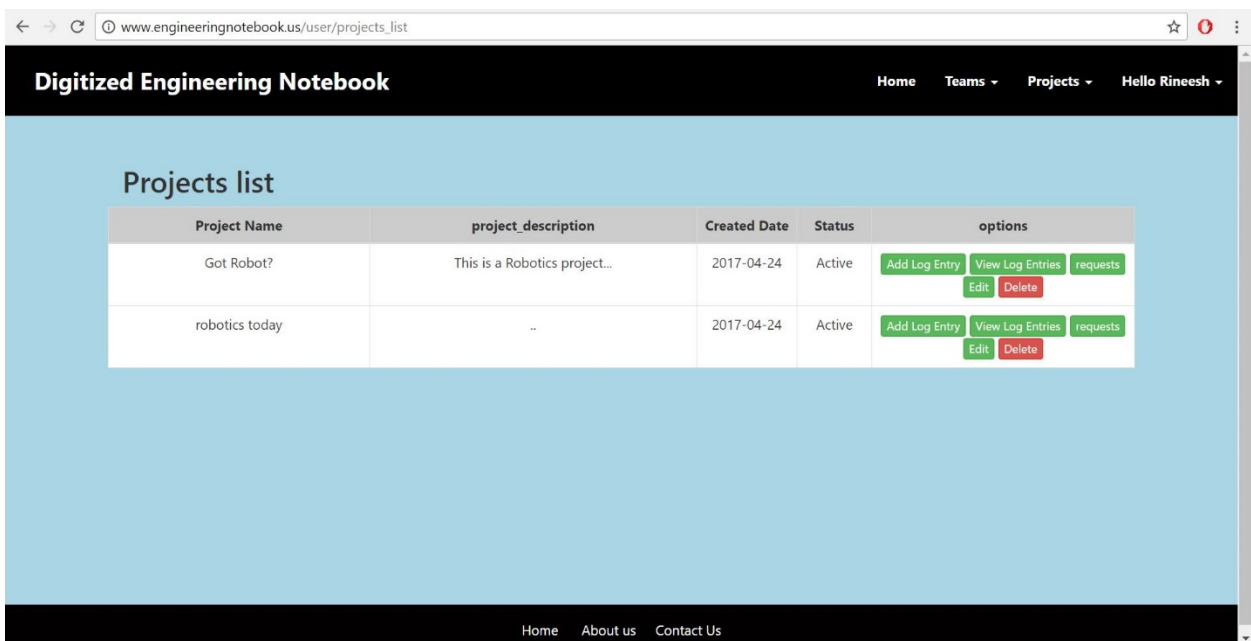
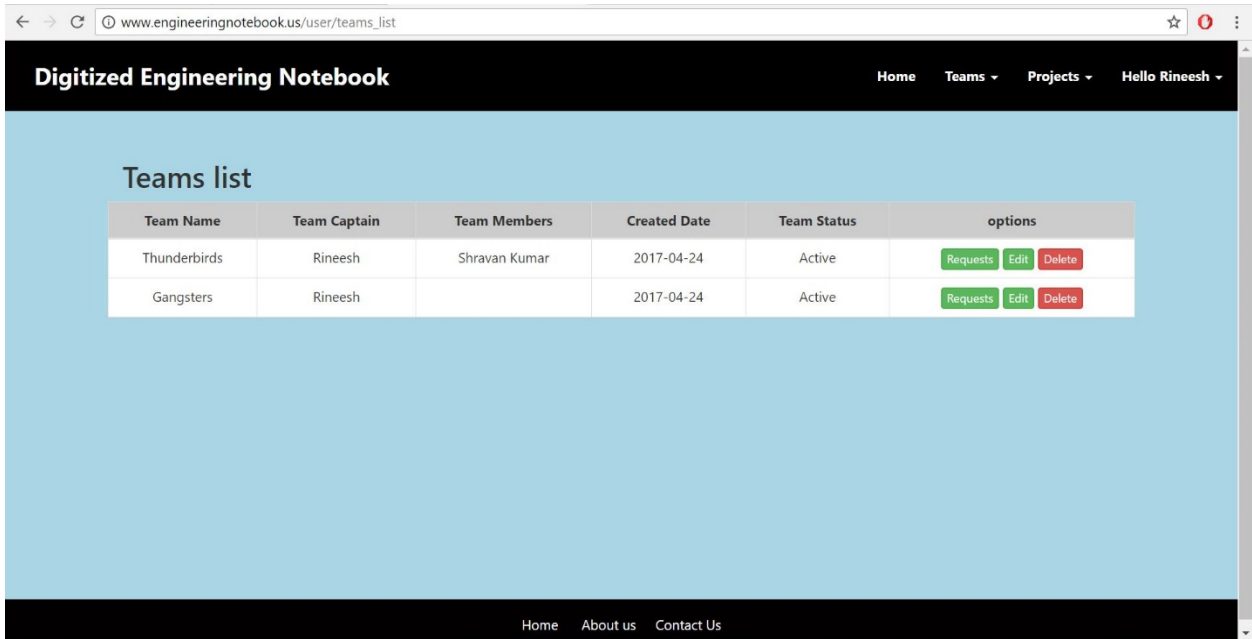


Figure 16: Captain Project List Page

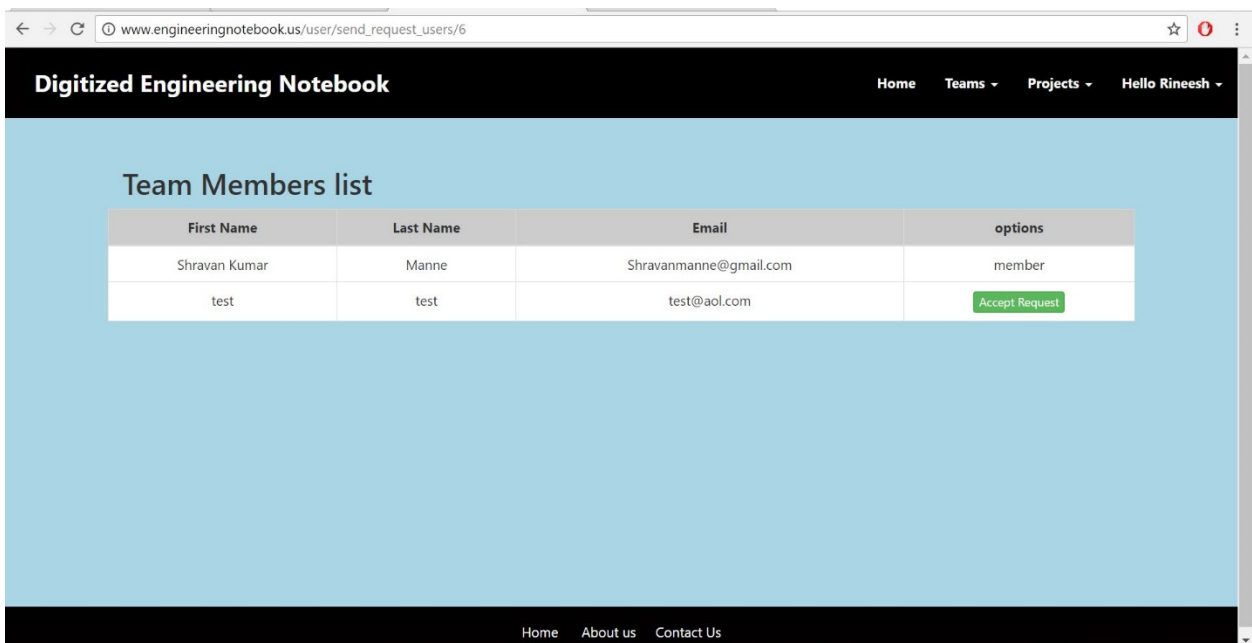
This page shows the teams list created by the captain.



Team Name	Team Captain	Team Members	Created Date	Team Status	options
Thunderbirds	Rineesh	Shravan Kumar	2017-04-24	Active	<a href="#">Requests</a> <a href="#">Edit</a> <a href="#">Delete</a>
Gangsters	Rineesh		2017-04-24	Active	<a href="#">Requests</a> <a href="#">Edit</a> <a href="#">Delete</a>

Figure 17: Captain Teams List Page

Captain creates teams and adds members, the members listed in the team is viewed in the captain team's members list page.



First Name	Last Name	Email	options
Shravan Kumar	Manne	Shravanmanne@gmail.com	member
test	test	test@aol.com	<a href="#">Accept Request</a>

Figure 18: Captain Team Members List Page

This is the member project list page, member requests the captain for the access of project, once the access for a project is granted the project will be visible here.

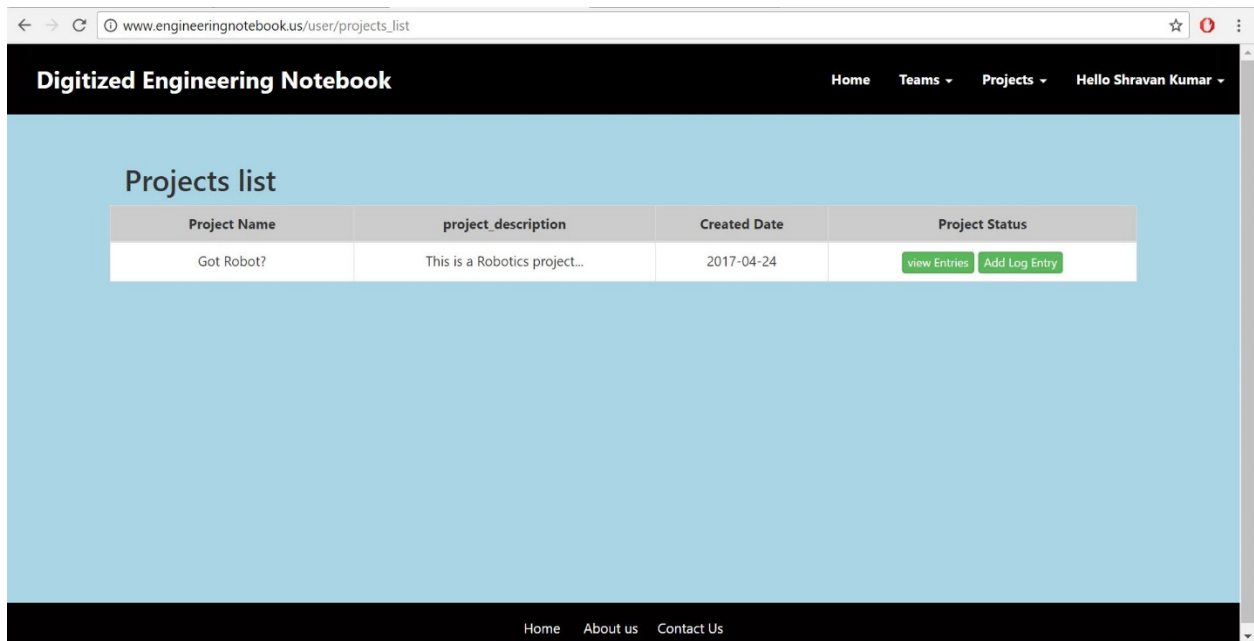


Figure 19: Member Project List Page

This page shows the member about the other members working in a project.

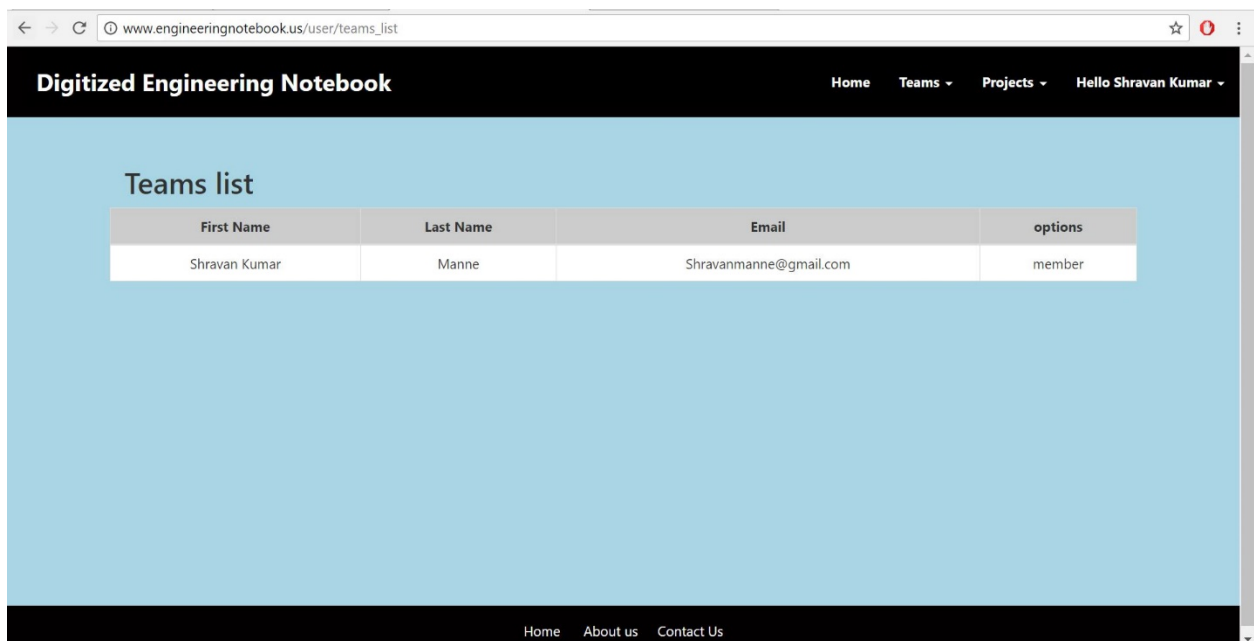


Figure 20: Member Team List Page

This is user profile update page, allows user to update his profile page.

The screenshot shows a web browser window with the address bar displaying `www.engineeringnotebook.us/user/my_account`. The page has a black header with the site name "Digitized Engineering Notebook" on the left and navigation links "Home", "Teams", "Projects", and "Hello Shravan Kumar" on the right. The main content area has a light blue background and is titled "My Profile". It contains three input fields: "Name" (pre-filled with "Shravan Kumar"), "Email" (empty), and "Phone Number" (empty). Below these fields is a green "Update" button. A black footer at the bottom contains the links "Home", "About us", and "Contact Us".

Figure 21: User Profile Update Page

Here user can change password. User password gets updated.

The screenshot shows a web browser window with the address bar displaying `Not secure | www.engineeringnotebook.us/user/change_password`. The page has a black header with the site name "Digitized Engineering Notebook" on the left and navigation links "Home", "Teams", "Projects", and "Hello Shravan Kumar" on the right. The main content area has a light blue background and is titled "Change Password". It contains two input fields: "Password" and "Confirm Password", both of which are empty. Below these fields is a green "Change Password" button. A black footer at the bottom contains the links "Home", "About us", and "Contact Us".

Figure 22: User Password Update



Here the PDF can be downloaded. The project logs, tasks and activities can be downloaded in PDF format.

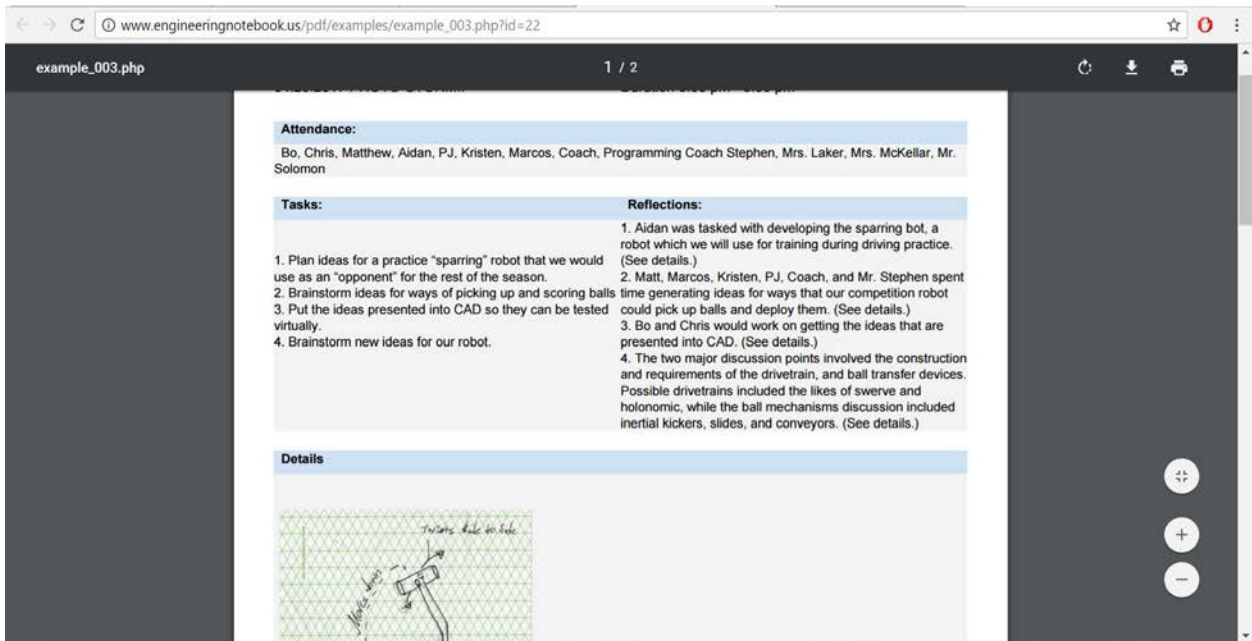


Figure 23: PDF Download Page

ADMIN CONSOLE:

The figure shown is admin login page

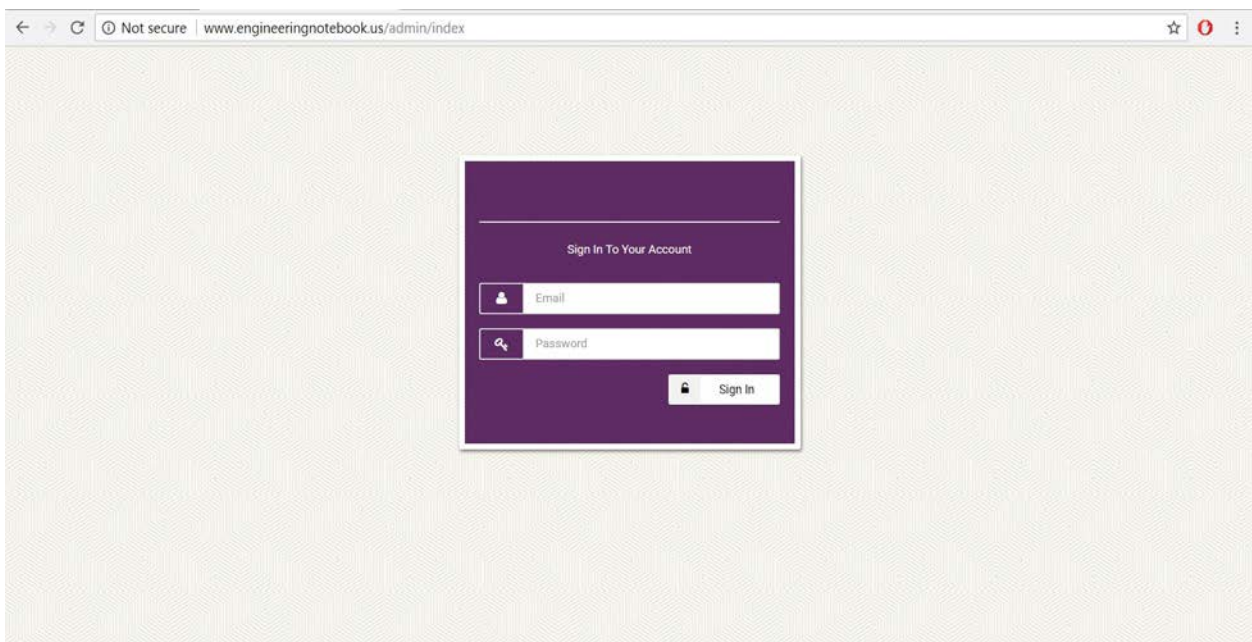


Figure 24: Admin Login Page



This shows the Admin Dashboard

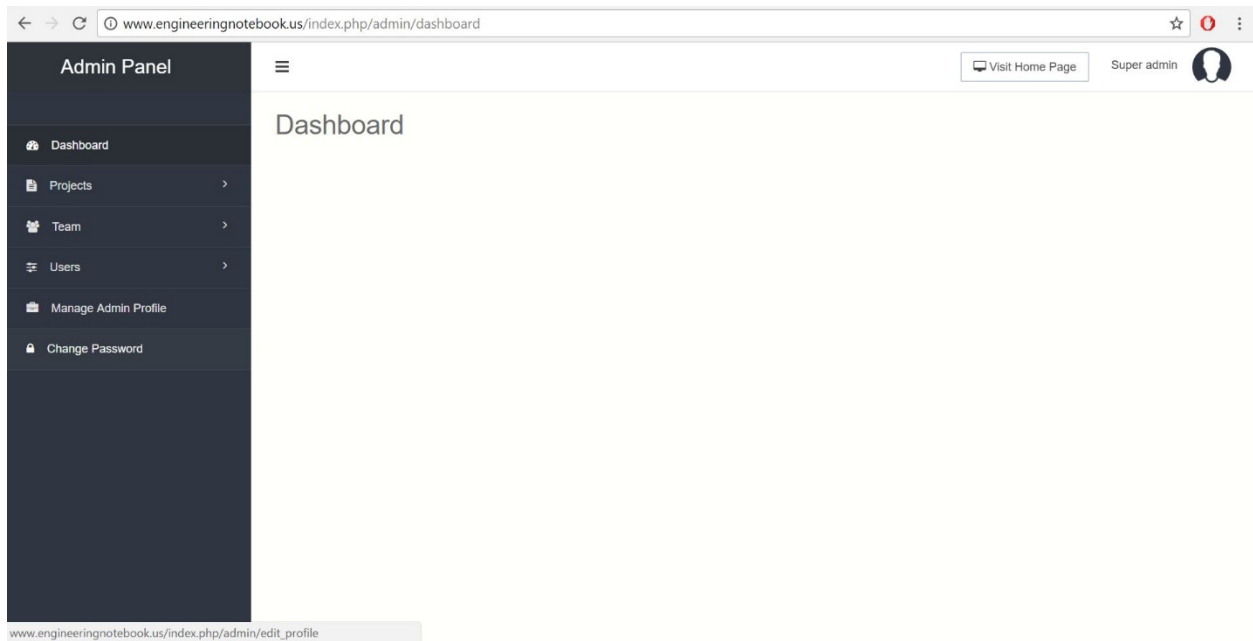


Figure 25: Admin Dashboard Page

This is Project List that admin can view how many projects has been working and he has a privilege to delete the project.

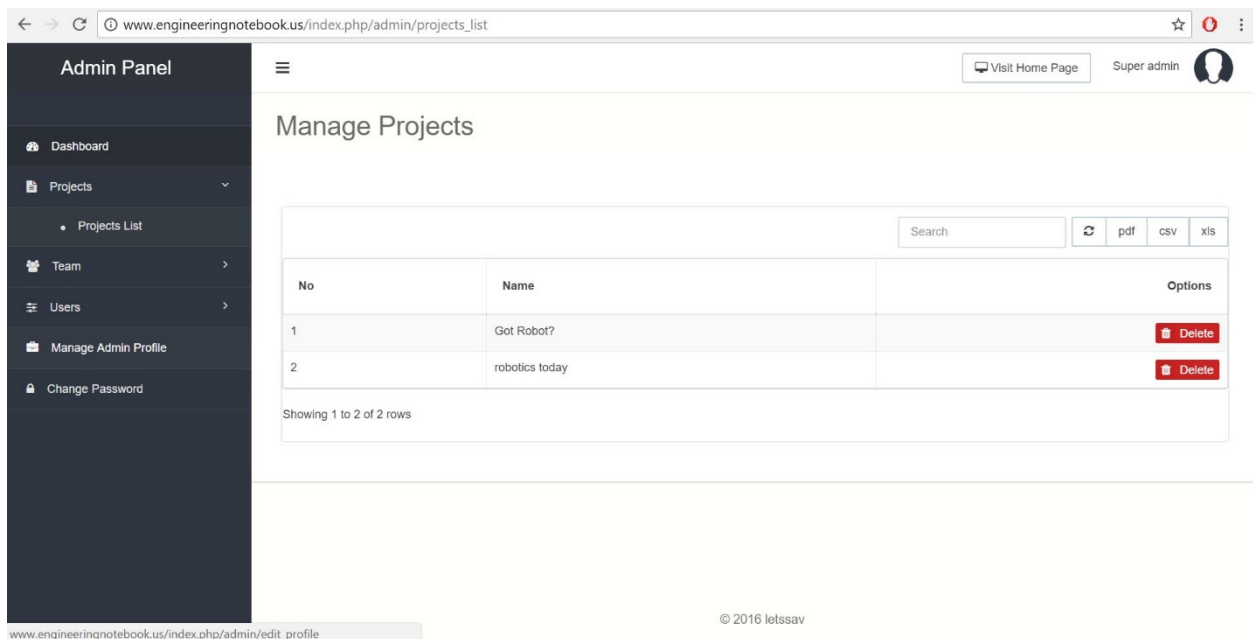
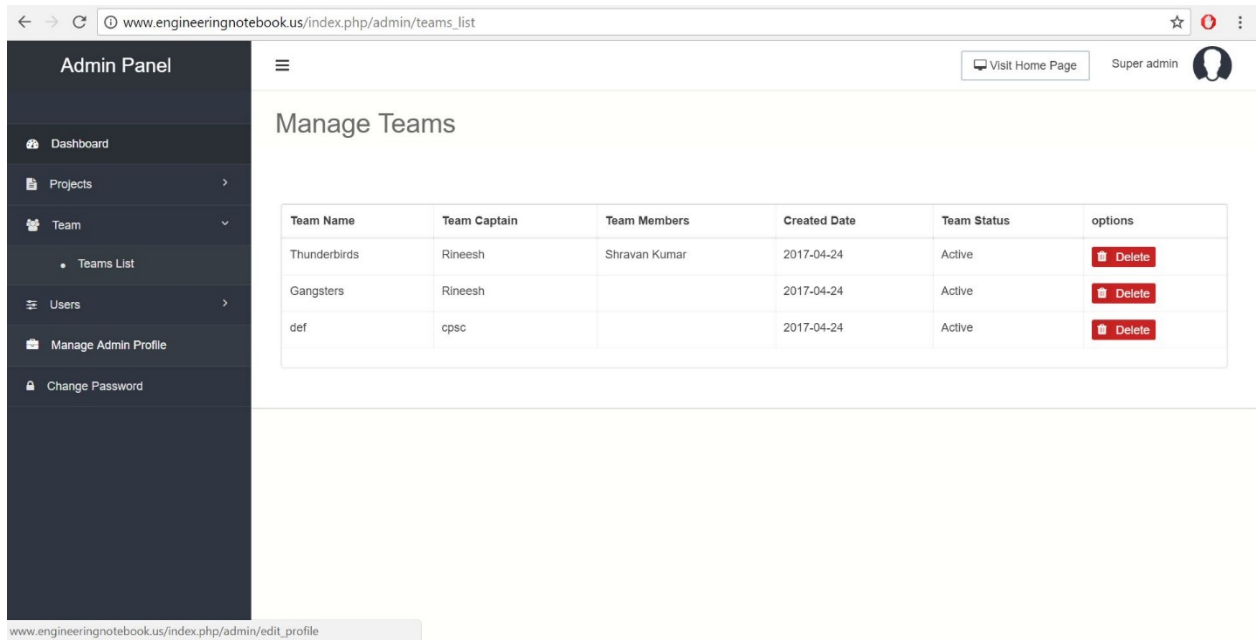


Figure 26: Admin Project List Page

This is Team List that admin can view how many Team are working, Admin has a privilege to delete the Team.



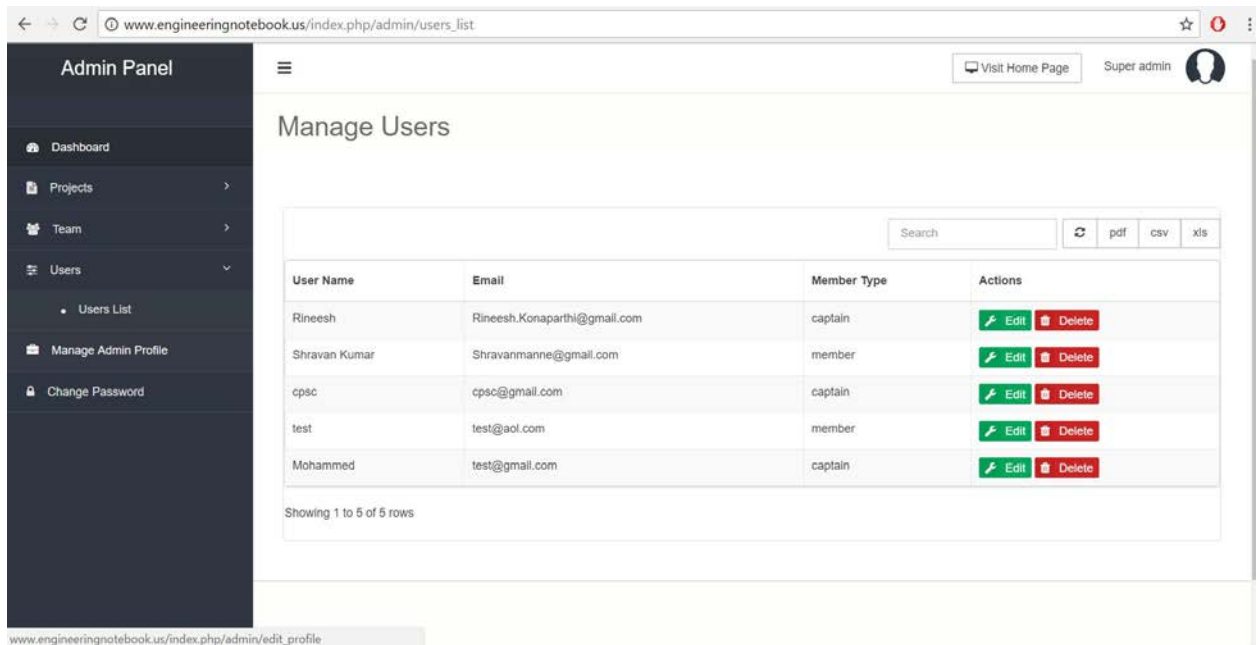
The screenshot shows the 'Admin Panel' on the left sidebar with options: Dashboard, Projects, Team (expanded), Users, Manage Admin Profile, and Change Password. The 'Team' section is selected, showing 'Teams List'. The main content area is titled 'Manage Teams' and contains a table with the following data:

Team Name	Team Captain	Team Members	Created Date	Team Status	options
Thunderbirds	Rineesh	Shravan Kumar	2017-04-24	Active	<a href="#">Delete</a>
Gangsters	Rineesh		2017-04-24	Active	<a href="#">Delete</a>
def	cpsec		2017-04-24	Active	<a href="#">Delete</a>

The browser address bar shows 'www.engineeringnotebook.us/index.php/admin/teams\_list'. The footer of the page shows 'www.engineeringnotebook.us/index.php/admin/edit\_profile'.

Figure 27: Admin Team List Page

This page shows that how many users are there to the website working on their project's.



The screenshot shows the 'Admin Panel' on the left sidebar with options: Dashboard, Projects, Team, Users (expanded), Manage Admin Profile, and Change Password. The 'Users' section is selected, showing 'Users List'. The main content area is titled 'Manage Users' and contains a table with the following data:

User Name	Email	Member Type	Actions
Rineesh	Rineesh.Konaparthi@gmail.com	captain	<a href="#">Edit</a> <a href="#">Delete</a>
Shravan Kumar	Shravanmanne@gmail.com	member	<a href="#">Edit</a> <a href="#">Delete</a>
cpsec	cpsec@gmail.com	captain	<a href="#">Edit</a> <a href="#">Delete</a>
test	test@aol.com	member	<a href="#">Edit</a> <a href="#">Delete</a>
Mohammed	test@gmail.com	captain	<a href="#">Edit</a> <a href="#">Delete</a>

Below the table, it says 'Showing 1 to 5 of 5 rows'. Above the table, there is a search bar and export options: pdf, csv, xls. The browser address bar shows 'www.engineeringnotebook.us/index.php/admin/users\_list'. The footer of the page shows 'www.engineeringnotebook.us/index.php/admin/edit\_profile'.

Figure 28: Admin User List Page

This is Admin Profile where he can make changes to his profile.

The screenshot shows a web browser at `www.engineeringnotebook.us/index.php/admin/edit_profile`. The page has a dark sidebar with the 'Admin Panel' menu, where 'Manage Admin Profile' is selected. The main content area is titled 'Manage Profile' and contains two sections: 'Manage Details' and 'Change Password'.

**Manage Details:**

- Name:
- Email:
- [Update Profile](#)

**Change Password:**

- Current Password:
- New Password\*:
- Confirm Password:

Figure 29: Admin Profile Page

MySQL Database:

All the tables were created in the database and those tables will reflect in the admin page. By default, one admin user can be created while creating database. All details which are entered by admin and user will be reflected in the database. Here, in the below figure we can observe the tables in the project.

The screenshot shows the phpMyAdmin interface for the 'engineering\_notebook' database. The 'Structure' tab is active, displaying a list of 13 tables. Each table row includes icons for various actions (Browse, Structure, Search, Insert, Empty, Drop) and columns for Rows, Type, Collation, Size, and Overhead.

Table	Action	Rows	Type	Collation	Size	Overhead
admin	Browse Structure Search Insert Empty Drop	1	InnoDB	latin1_swedish_ci	16 K B	-
banners	Browse Structure Search Insert Empty Drop	2	InnoDB	latin1_swedish_ci	16 K B	-
events	Browse Structure Search Insert Empty Drop	1	InnoDB	latin1_swedish_ci	16 K B	-
gallery	Browse Structure Search Insert Empty Drop	0	InnoDB	latin1_swedish_ci	16 K B	-
gallery_images	Browse Structure Search Insert Empty Drop	0	InnoDB	latin1_swedish_ci	16 K B	-
projects	Browse Structure Search Insert Empty Drop	4	InnoDB	latin1_swedish_ci	16 K B	-
project_log_entries	Browse Structure Search Insert Empty Drop	8	InnoDB	latin1_swedish_ci	48 K B	-
project_members	Browse Structure Search Insert Empty Drop	4	InnoDB	latin1_swedish_ci	16 K B	-
subscribers	Browse Structure Search Insert Empty Drop	1	InnoDB	latin1_swedish_ci	16 K B	-
teams_list	Browse Structure Search Insert Empty Drop	2	InnoDB	latin1_swedish_ci	16 K B	-
team_members	Browse Structure Search Insert Empty Drop	2	InnoDB	latin1_swedish_ci	16 K B	-
users	Browse Structure Search Insert Empty Drop	4	InnoDB	latin1_swedish_ci	16 K B	-
videos	Browse Structure Search Insert Empty Drop	0	InnoDB	latin1_swedish_ci	16 K B	-
<b>13 tables</b>	<b>Sum</b>	<b>29</b>	<b>InnoDB</b>	<b>latin1_swedish_ci</b>	<b>240 K B</b>	<b>0 B</b>

Figure 30: Database Tables Page

### **2.3 Interactions with other Projects (if Any)**

This project is built for the educational purposes and has no interactions with any other projects.

### **2.4 Interactions with other Applications**

The projects online web application has no interaction with any of its similar applications.

### **2.5 Capabilities**

All the information like user (captain and member) profile data, user credentials, Team details, Project Details, Project logs are all saved into the backend database. All the data is dynamically retrieved and updated based on the user activities. This website accepts only the registered users to login and access the contents. These registered users can view and manage their teams and projects.

### **2.6 Risk Assessment and Management**

The main risk of the project is to communication with the stakeholders to gather the requirements.

- Schedule risk: Project schedule may skip and release may bleed.
- Budget risk: Inappropriate budget estimation.
- Operational Risks: Insufficient resources.
- No proper training.

## **3 Project Requirements**

### **3.1 Identification of Requirements**

We have temporarily hosted the project over the internet, that can be accessible from anywhere. “<http://engineeringnotebook.us/>” is the website URL for the project online, which redirects and displays the Digitized Engineering Notebook. On the local host with the XAAMP server it can be accessible through “[http://localhost/engineering\\_notebook/](http://localhost/engineering_notebook/)”, to do this one must make sure they have the XAAMP server installed and the Apache and MySQL servers are set to ‘Start’. This website mainly has three consoles, a captain, a member and an administrator. It is developed by the following requirements:

- R01:** A front page with welcome message and a menu for navigation
- R02:** Admin console for site administration
- R03:** Option to create a new project or select an existing project
- R04:** Add team members to project
- R05:** Table of content (or log index)
- R06:** Creation of dated log entries for ideas, details, observations, etc.
- R07:** Chronological listing of log entries
- R08:** File upload for text documents, drawings, sketches, figures, etc.
- R09:** Allow multimedia elements such as pictures and videos embedded in Web pages
- R10:** Search and listings
- R11:** Calendar of events
- R12:** Discussion board
- R13:** Printing of log
- R14:** Creation of PDF version of log

### 3.2 *Operations, Administration, Maintenance and Provisioning (OAM&P)*

#### **Development:**

Digitized Engineering Notebook is a web application developed with the php scripting language. Hypertext Preprocessor (PHP) is a one of the most widely used scripting languages. Using the CodeIgniter framework for the PHP, we have built our project. We used the Xampp environment for the development of project. The project contains various. php files for the application and a .sql file for the database. These files, run together to provide the Digitized engineering notebook.

#### **Deployment:**

This project can be deployed on to the localhost or on to a real-time domain. For the localhost, we use the Xampp server, in which we configure the paths and set the database connections for the project. Once all the connections are established, it can be executed over a browser.

Coming to the web deployment of the project, we need a domain and a cpanel to establish the project. We create a database on the hosting cpanel and add a user for that database. After that, we upload our local database .sql file on to the 'phpmyadmin' folder to set the database. Now, we can go to the public domain and upload all our files on to the folder. Setting all the database connections and configuration paths are set correctly, we can access the project through the domain URL.

### 3.3 *Security and Fraud Prevention*

After the working of a project it is very important to properly secure it. Security is one of the major issue to every project. In our project users provide their username and password to log in to the website. This is all the confidential data of the user and must be strictly protected. For this, we are using the password encryption method, all the passwords are encrypted in 'Message Digest algorithm 5' in the database. This encrypted password is fetched directly form the database whenever the user attempts to sign in. If somebody enters the wrong password it displays an error message.

### 3.4 *Release and Transition Plan*

#### **Time Management:**

- *Project Start Date:* 01/23/2017
- *First seminar presentation:* 02/08/2017  
Brief on abstract, technologies and even specifications were highlighted
- *Second seminar:* 03/06/2017  
Suggestions of design and developments of project were discussed
- *Final seminar:* 04/24/2017  
Concluding execution and project release is planned on this day

## 4 Project Design Description

This Digitized Engineering Notebook web application was designed based on the following ER diagram, Use case diagram, UML diagram and sequence diagrams:

ER Diagram:

The admin has all the privileges to manage the website, right from the user management to deleting the users, teams and projects. Whereas, the Captains privileges are limited just to accepting the team creation, project creation, accepting members and editing logs. Member is privileged only to access, view and add the log entries to a project he is accepted to.

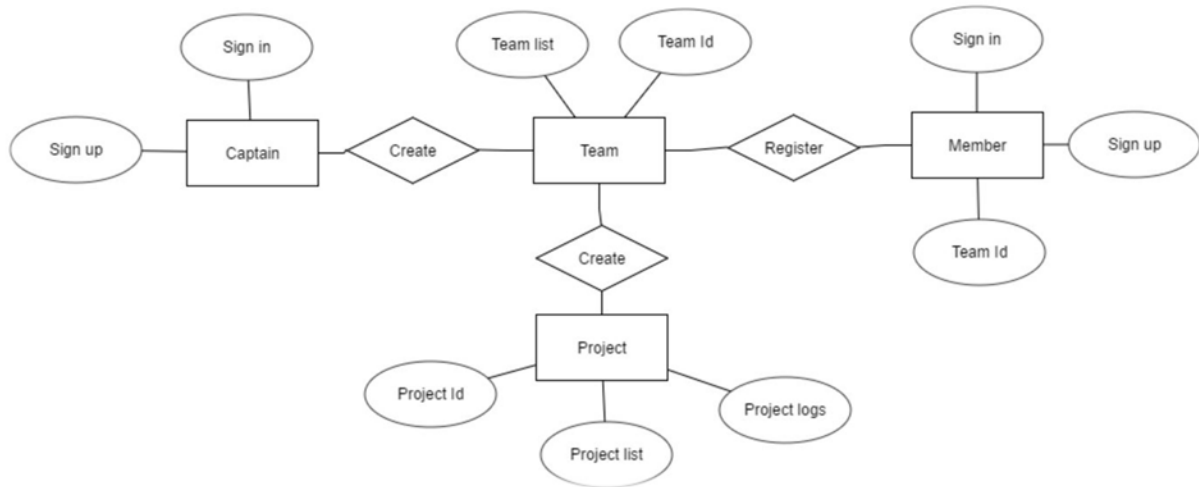


Figure 31: Entity Relationship Diagram

Class Diagram:

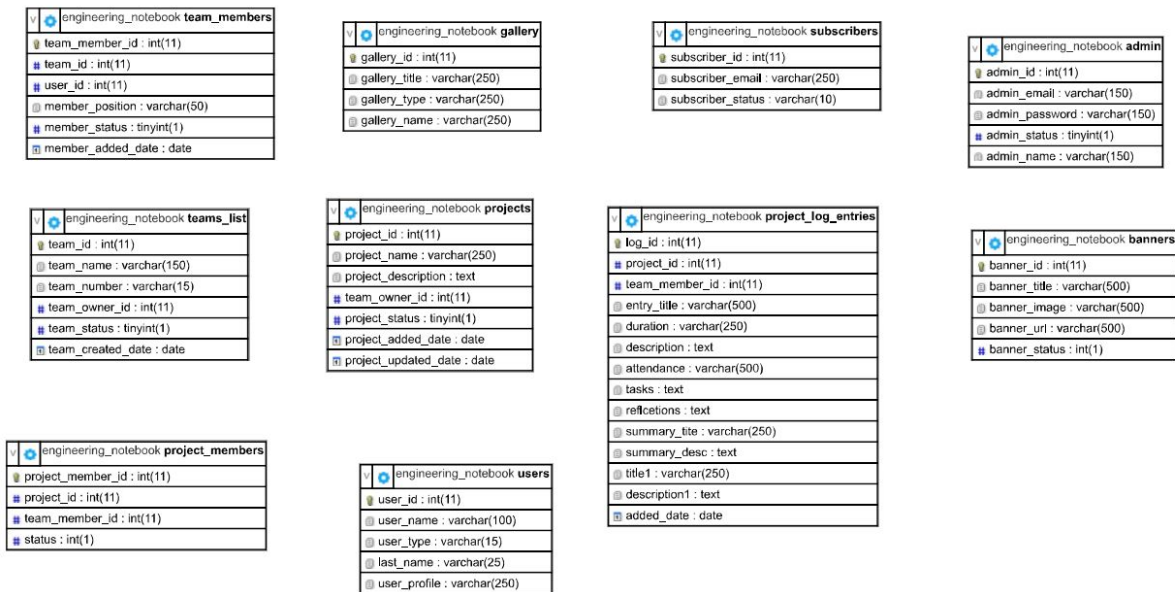


Figure 32: Classes in the Project

## **5    *Internal/external Interface Impacts and Specification***

Digitized Engineering Notebook has a neat user friendly interface for its users. It has a modest home page with a set of options displayed at the top right corner, which carry their own functionalities. Going through these options we can sign up a user, sign in to our account, access the application functionalities. The administrator can manage and maintain the application website.

## **6    *Design Units Impacts***

Any future changes in requirements for this project doesn't affect the current architecture and functionality.

### **6.1    *Functional Area A/Design Unit A***

#### **6.1.1    *Functional Overview***

Digitized Engineering Notebook is a web application which lets users to create their project documents. Users can create their accounts according to their roles, here in captain or member. The functions of the captain are creating a team, adding team members, creating projects, approving project members, managing the teams, projects and members. The functions of the member include requesting the team joins, project joins, adding and editing the project logs. The entire application is managed by an administrator. The functions of the administrator include managing teams, projects, users (both captains and members) and application maintenance.

#### **6.1.2    *Areas***

Below are the functional areas which are handled by our project team:

- Scope of the project: We have decided our boundaries in the project. It basically helps the robotic projects, but the user can even develop any project with minor changes in it.
- Team Communication: The Digitized Engineering Notebook lets its users to communicate with each other over the application. A message box can be inserted in the future enhancements.
- Quality of the project: The project is built with CodeIgniter framework, which is probably the best php frameworks available in the market.
- Project Deliverables: This project delivers a priority based user profiles which lets them create their project works online. The project document can be downloaded as a pdf file. We can download individual page, a set of pages or an entire document as the pdf.

#### **6.1.3    *Requirements***

The following are the important functional requirements on which the project had been developed:

- Login Functionality: The project lets two user profiles, one for the captain and the member. The captain creates teams, projects and manages them. The member logs in to access the projects, view them, add content and download the documents.
- Administrative permissions: The application has a super admin, who is responsible for the maintenance of the website. The administrator manages the users, teams, projects and maintains the projects.
- Team creation: Captain creates a team with a unique ID assigned to it. This ID helps the member to sign up to his project.
- Project creation: Captain starts a project and add the responsible members to it. These members and the captain together work on the project.
- Pdf download: The application lets its users to download the project as a pdf document. The users can download a single page document, a part of it or the entire document. The user can search the documents providing the dates.

## **7    *Open Issues***

All the Open Issues were resolved.

## 8 *Acknowledgements*

Working on this project “Digitized Engineering Notebook” was a source of immense knowledge to our team. WE would like to express our sincere gratitude to Dr. Clare Tang, for her guidance and valuable support throughout the course of the project work. We acknowledge the Governors State University for providing a wonderful opportunity to work.

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